

Serial No. 10/725,021

Docket No. DPO-0008

Amdt. dated December 13, 2006

Reply to Office Action of September 14, 2006

REMARKS

By the present response, Applicants have canceled claims 26 and 28 without disclaimer.

Further, Applicants have amended claims 14, 25, 27 and 29 to further clarify the invention.

Claims 1-4, 8-10, 14, 16-25, 27, 29 and 32 remain pending in this application. Reconsideration and withdrawal of the outstanding rejections and allowance of the present application are respectfully requested in view of the above amendments and the following remarks.

In the Office Action, claims 1, 8-10 and 32 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,198,251 (Landon). Claims 25-29 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Publication No. 2001/0005124 (Odeohhara). Claims 2-4 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Landon. Claims 14-24 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Odeohhara in view of U.S. Patent No. 5,637,979 (Tamai).

35 U.S.C. § 102 Rejections

Claims 1, 8-10 and 32 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Landon. Applicants respectfully traverse these rejections.

Landon discloses that a plurality of batteries located in battery-operated devices are charged in automated sequence in situ by a charger through a distributor where there is no communication between the distributor and the batteries, preferably using pulsed charged technology. The pulsed technology includes both forward and reverse pulses.

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Regarding claim 1, Applicants submit that Landon does not disclose or suggest the limitations in the combination of this claim. The Examiner appears to assert that col. 4, lines 3-22 of Landon disclose each and every limitation in claim 1 of the present application. Applicants submit that the Examiner has made an improper § 102 rejection in that the Examiner has failed to show specifically where in the asserted reference each and every limitation in the claims is disclosed or suggested.

Column 4, lines 3-22 of Landon merely disclose that the distributor sequentially directs current to batteries to fully charge each battery in sequence before beginning the charging of the next battery, or to charge the batteries using several sequential charging cycles, i.e., approximately 10% each during a first charging cycle, then another 10% during another charging cycle, and so forth. This is not charging each of the plurality of batteries where the alternative charging is based on satisfying a charging voltage of each of the plurality of batteries being greater than a reference voltage and a charging current of each of the plurality of batteries being less than a limit current, as recited in the claims of the present application. Landon merely discloses a distributor sequentially directing current to batteries to sequentially charge a battery approximately 10% during each charging cycle. Landon does not disclose or suggest controlling charging where the alternate charging is based on a charging current of each of the plurality of batteries being less than a limit current.

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Further, Landon does not disclose or suggest resuming charging of a first battery, or a second battery, until the charging current is less than a limit current indicating a state of full charge. Landon merely relates to sequentially charging a battery approximately 10% during a first charging cycle, then another 10% during each subsequent charging cycle. Landon does not disclose or suggest using charging of a battery until the charging current is less than a limit current indicating a state of full charge.

Regarding claims 8-10 and 32, Applicants submit that these claims are dependent on independent claim 1 and, therefore, are patentable at least for the same reasons noted previously regarding this independent claim.

Accordingly, Applicants submit that Landon does not disclose or suggest the limitations in the combination of each of claims 1, 8-10 and 32 of the present application. Applicants respectfully request that these rejections be withdrawn and that these claims be allowed.

Claims 25-29 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Odeohhara et al. Claims 26 and 28 have been canceled. Applicants respectfully traverse these rejections as to the remaining pending claims.

Odeohhara et al. discloses a charge control method and computer by which batteries can be efficiently charged, even if the charging is aborted, where a charge to the main battery is started and then the charge to the main battery is stopped when the amount of electric charge in the main battery reaches a predetermined value. Next, the charge to the second battery is started

and then the charge to the second battery is stopped when the amount of electric charge in the second battery reaches a predetermined value. Then the charge to the main battery is restarted and then the charge to the main battery is stopped when the amount of electric energy in the main battery reaches 100%. The charge to the second battery is restarted and then the charge to the second battery is stopped when the amount of electric energy in the second battery reaches 100%.

Regarding claim 25, Applicants submit that Odeohhara et al. does not disclose or suggest the limitations in the combination of this claim. For example, the Examiner appears to assert that Odeohhara et al. in paragraph 23 and Fig. 4, SW1, SW2 and 82 disclose each of the limitations in claim 25 of the present application. However, these portions merely disclose a controller 82 that controls the alternate charging of a main battery and a second battery via SW1 and SW2, respectively, where each battery is charged until the amount of electric energy in it reaches approximately 80% of its capacity, and charging being switched to the other battery until 80% of its capacity is reached and then each battery is alternately fully charged. This is not alternate charging being based on satisfying charging voltage/current characteristics related to a reference voltage and a charging current being less than a reference current, as recited in the claims of the present application. Odeohhara et al. relates to charging a battery until an amount of electric energy reaches predetermined value, where the amount of electric energy is determined by dividing a voltage of the battery through a resistor series and then looking up the

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electric energy in a table. This is not alternative charging being based on satisfying voltage/current characteristics related to a reference voltage and a charging current being less than a reference current, as recited in the claims of the present application. Odeohhara et al. merely relates to detecting an electric energy of the battery based on voltage from a resistor network as defined in a lookup table.

Further, Odeohhara et al. does not disclose or suggest a control circuit controlling resuming charging of a first battery until the charging current is less than the reference current and controlling resuming charging of the second battery until the charging current is less than the reference current, as recited in the claims of the present application.

Regarding claims 27 and 29, Applicants submit that these claims are dependent on independent claim 25 and, therefore, are patentable at least for the same reasons noted regarding this independent claim.

Accordingly, Applicants submit that Odeohhara et al. does not disclose or suggest the limitations in the combination of each of claims 25, 27 and 29 of the present application. Applicants respectfully request that these rejections be withdrawn and that these claims be allowed.

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35 U.S.C. § 103 Rejections

Claims 2-4 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Landon. Applicants respectfully traverse these rejections and submit that these claims are dependent on independent claim 1 and, therefore, are patentable at least for the same reasons noted previously regarding this independent claim.

Accordingly, Applicants submit that Landon does not disclose, suggest or render obvious the limitations in the combination of each of claims 2-4 of the present application. Applicants respectfully request that these rejections be withdrawn and that these claims be allowed.

Claims 14-24 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Odeohhara et al. in view of Tamai et al. Applicants respectfully traverse these rejections.

Tamai et al. discloses a plurality of series connected rechargeable batteries being charged by detecting battery voltages and controlling charging current. Normal charging is performed until any one battery voltage reaches a prescribed voltage. After any one battery voltage reaches the prescribed voltage, all batteries are charged such that a charging current is controlled to keep each battery voltage from exceeding the prescribed voltage.

Regarding claim 14, Applicants submit that none of the cited references, taken alone or in any proper combination, disclose suggest or render obvious the limitations in the combination of this claim of, *inter alia*, completing charging of one of the first battery and the second battery based on the charging voltage/current characteristic of the one of the first battery and the

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second battery, the charging voltage/current characteristic being related to a reference current, the completing charging comprising resuming charging of one of the first battery and the second battery until a charging current is less than the reference current. As noted previously, Odeohhara et al. relates to charging batteries related to an amount of electric energy in the battery, which is related to a voltage in a look up table. This is not resuming charging of one of a first battery and a second battery until a charging current is less than a reference current, as recited in the claims of the present application. The stopping and starting of charging the batteries in Odeohhara et al. is solely related to a voltage (i.e., amount of electric energy). Further, Tamai et al. discloses normal charging being preformed until any one battery voltage reaches a prescribed voltage and then charging all batteries with a charging current to keep each battery voltage from exceeding a prescribed voltage. Tamai et al. does not disclose or suggest a charging current being less than a reference current or resuming charging of a battery until the charging current is less than a reference current.

Regarding claims 15-24, Applicants submit that these claims are dependent on independent claim 14 and, therefore, are patentable at least for the same reasons noted regarding this independent claim.

Accordingly, Applicants submit that none of the cited referenced, taken alone or in any proper combination, disclose suggest or render obvious the limitations in the combination of

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each of claims 14-24 of the present application. Applicants respectfully request that these rejections be withdrawn and that these claims be allowed.

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CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that claims 1-4, 8-10, 14-25, 27, 29 and 32 are now in condition for allowance. Accordingly, early allowance of such claims is respectfully requested. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, Frederick D. Bailey, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
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